Question Number	Scheme	Marks
1.(a)	(i) $a_2 = 1$	B1
	(ii) $a_{107} = 3$	B1 **(2)**
(b)	$\sum_{n=1}^{200}\left(2a_n - 1\right) = 5+1+5+1+.....5+1 = 100\times\left(5+1\right)$	M1
	$= 600$	A1 **(2)**
		(4 marks)

Question Number	Scheme	Marks
7. (i)	States or implies that $4\times6^{n-1} > 10^{100}$	B1
	Takes logs correctly to produce an equation without powers $4\times6^{n-1} > 10^{100} \Rightarrow \log 4 + (n-1)\log 6 > 100\log 10$	M1
	$n = 129$	A1 **(3)**
(ii) (a)	States $ar = -6$ and $\frac{a}{1-r} = 25$	B1
	Combines to form an equation in $r \Rightarrow \frac{-6}{r(1-r)} = 25$	M1
	$\Rightarrow -6 = 25r(1-r) \Rightarrow 25r^2 - 25r - 6 = 0$ *	A1* **(3)**
(b)	$r = \frac{6}{5}, -\frac{1}{5}$	B1 **(1)**
(c)	$r = -\frac{1}{5}$ as $\lvert r\rvert < 1$ (for S_∞ to exist)	B1 **(1)**
(d)	Attempts $S_4 = \frac{a\left(1-r^n\right)}{1-r}$ with $n = 4, r = \text{their}(c)$ and $a = \frac{-6}{\text{their}(c)}$	M1
	$S_4 = \frac{30\left(1-\left(-\frac{1}{5}\right)^4\right)}{1-\left(-\frac{1}{5}\right)} = 24.96$ o.e.	A1 **(2)**
		(10 marks)

Question Number	Scheme	Marks
2.(a)	E.g. $64\times\left(-\frac{1}{2}\right)^3=-8$ ✓ *	M1, A1* **(2)**
(b)	Finds the value of a. E.g. $64\div\left(-\frac{1}{2}\right)^2=256$	M1, A1
	Uses $S_\infty=\frac{a}{1-r}=\frac{256}{1-\left(-\frac{1}{2}\right)}=\frac{512}{3}$	M1, A1 **(4)** **(6 marks)**

Question Number	Scheme	Marks
7.(a)	Attempts to use $4000=300+11d$ to find 'd'	M1
	Uses $300+3"d"$	M1
	Wheat production in year 4 is awrt 1310 (to the nearest 10) (tonnes)	A1
		(3)
(b)	Attempts to use $4000=300r^{11}$ to find 'r'	M1
	Finds $r=(1.266...)$ and MULTIPLIES this by 300	M1
	Wheat production in year 2 is awrt 380 (to the nearest 10) (tonnes)	A1
		(3)
(c)	Attempts $\frac{12}{2}\{300+4000\}$ or $\frac{300\left("1.266..."^{12}-1\right)}{"1.266..."-1}$	M1
	Finds $\frac{12}{2}\{300+4000\}-\frac{300\left("1.266..."^{12}-1\right)}{"1.266..."-1}=(25800-17935)$	dM1
	Difference = 7860 but allow 7870 (tonnes) (not AWRT)	A1
		(3)
		(9 marks)